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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,714	09/17/2003	Daijiro Inoue	57810-076	2234

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McDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER
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SEFER, AHMED N

ART UNIT	PAPER NUMBER
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2826

MAIL DATE	DELIVERY MODE
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11/23/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/663,714	<b>Applicant(s)</b> INOUE ET AL.	
	<b>Examiner</b> A. Sefer	<b>Art Unit</b> 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-10, 12 and 14-29 is/are pending in the application.
- 4a) Of the above claim(s) 8, 10, 17-22, 24 and 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 9, 12, 14-16, 23 and 26-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1, 26 and 27 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 26 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The application as originally filed does not specifically support the claim limitation, "without another second conductivity type layer having a thickness of less than 0.1 um."

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 26 is rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al. ("Ito") JP 11-145518.

Ito discloses in fig. 1 a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 3 formed on a substrate 1; an active layer 4 formed on said first conductivity type first nitride-based semiconductor layer; a second conductivity type second nitride-based semiconductor layer 5, having a single layer structure with a thickness of at least 0.1 um (par. 14 of machine translated document) formed on said active layer; an undoped contact layer 6 formed directly on said second nitride-based semiconductor layer without another second conductivity type layer having a thickness of less than 0.1 um intervening therebetween; and an electrode 7 formed directly on said undoped contact layer, wherein said undoped contact layer has a thickness within the recited range (par. 10 of machine translated document).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view Kamimura et al. ("Kamimura") JP 9-232680.

Ito discloses in fig. 1 a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 3 formed on a substrate 1; an active layer 4 formed on said first conductivity type first nitride-based semiconductor layer; a second conductivity type second nitride-based semiconductor layer 5, having a single layer structure with a thickness of at least 0.1  $\mu\text{m}$  (par. 14 of machine translated document); an undoped contact layer 6 formed directly on said second nitride-based semiconductor layer without another second conductivity type layer having a thickness of less than 0.1  $\mu\text{m}$  intervening therebetween; and an electrode 7 formed directly on said undoped contact layer, wherein said undoped contact layer has a thickness within the recited range (par. 10 of machine translated document), and the undoped contact layer does not include Al, but does not disclose undoped optical guide layer.

Kamimura discloses in fig. 1 a nitride-based semiconductor light-emitting device comprising a first conductivity type first nitride-based semiconductor layer 3 formed on a substrate; an active layer 5; a first undoped optical guide layer 6 formed on said active layer; a second conductivity type second nitride-based semiconductor layer 7, having a single layer structure formed on said first undoped optical guide layer.

Therefore, in view of Kamimura's teachings, one having an ordinary skill in the art at the time the invention was made would be motivated to modify Ito by incorporating an undoped optical guide layer. The motivation would be to prevent diffusion of dopants into the active layer. Therefore, it would have been obvious to combine Ito and Kamimura so as to yield the device of claim 1.

Re claim 2, Ito discloses the undoped contact layer (Co) having a band gap smaller than the band gap of said second nitride-based semiconductor layer (GaN).

Re claim 4, Ito discloses a first conductivity type first nitride-based semiconductor layer being an n-type first nitride-based semiconductor layer, and said second conductivity type second nitride-based semiconductor layer being a p-type second nitride-based semiconductor layer.

8. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view Kamimura.

Ito discloses in fig. 1 a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 3 formed on a substrate; an active layer 4 formed on said first conductivity type first nitride-based semiconductor layer; a second conductivity type second nitride-based semiconductor layer 5, having a single layer structure with a thickness of at least 0.1  $\mu\text{m}$  (par. 14 of machine translated document); an undoped contact layer 6 formed directly on said second nitride-based semiconductor layer without another second conductivity type layer having a thickness of less than 0.1  $\mu\text{m}$  intervening therebetween; and an electrode 7 formed directly on said undoped contact layer, wherein said undoped contact layer has a thickness within the recited range (par. 10 of machine translated document), but does not disclose undoped optical guide layer.

Kamimura discloses in fig. 1 a nitride-based semiconductor light-emitting device comprising a first conductivity type first nitride-based semiconductor layer 3 formed on a substrate; an active layer 5; a first undoped optical guide layer 6 formed on said active layer; a

second conductivity type second nitride-based semiconductor layer 7, having a single layer structure formed on said first undoped optical guide layer.

Therefore, in view of Kamimura's teachings, one having an ordinary skill in the art at the time the invention was made would be motivated to modify Ito by incorporating an undoped optical guide layer. The motivation would be to prevent diffusion of dopants into the active layer. Therefore, it would have been obvious to combine Ito and Kamimura so as to yield the device of claim 27.

Re claim 28, Kamimura discloses the band gap of said undoped contact layer (metal) being smaller than the band gap of said second nitride-based semiconductor layer (GaN).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ANS  
November 16, 2007

/A. Sefer/  
*Patent Examiner*  
*Art Unit 2826*